



## SEQUENCE LISTING

&lt;110&gt; KYOWA HAKKO KOGYO CO., LTD.,

&lt;120&gt; NOVEL POLYPEPTIDE

&lt;130&gt; 766.52

&lt;140&gt; US 09/856,617

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&lt;150&gt; H11-248442

&lt;151&gt; 1999-09-02

&lt;160&gt; 18

&lt;170&gt; PatentIn Ver. 2.0

&lt;210&gt; 1

&lt;211&gt; 4173

&lt;212&gt; DNA

&lt;213&gt; Mouse

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&lt;221&gt; CDS

&lt;222&gt; (107)..(4021)

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 Met Met Ala Gly Glu Gly Ser Thr  
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 Ile Thr Ser Arg Ile Lys Asn Leu Leu Arg Ser Pro Ser Ile Lys Leu  
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Pro	Lys	Lys	Val	Gly	Lys	Val	Tyr	Ser	Ala	Leu	Tyr	His	Ser	Ser	Cys	
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Ser Tyr Gln Asn His Thr Thr Ser Ser Met Ala Lys Leu Ala Arg Ser	
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Ile Ser Val Gly Glu Asn Pro Gly Leu Ala Thr Glu Pro Gln Ala Pro	
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Ala Pro Ile Arg Ile Ser Pro Phe Asn Lys Leu Ala Leu Pro Ser Arg	
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Ala His Leu Val Leu Asp Ile Pro Lys Pro Leu Pro Asp Arg Pro Thr	
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Glu Lys His Ser Cys Leu Gly Glu Gly Thr Thr His Lys Ser Arg Thr	
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Pro Val Asn Asn Leu Leu Gln Ala Glu Ser Leu Gln Pro Leu Ser Pro	
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Leu Ala Gly Ala Val Leu Ser Ser Pro Gly Gly Ser Pro Gly Ala Val	
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Arg Gly Pro Arg Asn Lys Lys Arg Gly Trp Arg Arg Leu Ala Glu Glu	

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Gly	Pro	Gln	Asp	Ile	Ile	Glu	Arg	Pro	Phe	Tyr	Asp	Leu	Trp	Asn	Pro	
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Pro Ala Leu Arg Arg Arg Arg Arg Gly Pro Arg Asn Lys Lys Arg Gly
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Trp Arg Arg Leu Ala Glu Glu Pro Leu Gly Leu Glu Val Asp Gln Phe
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ccc aca cca aag gcc aaa cct ggg ccc cag gac atc att gag cga ccc      579
Pro Thr Pro Lys Ala Lys Pro Gly Pro Gln Asp Ile Ile Glu Arg Pro
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Glu Leu Leu Arg Glu Asp Asn Glu Gln Leu Leu Thr Gln Tyr Glu Arg  
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Glu Lys Ala Leu Arg Lys Gln Ala Glu Glu Lys Phe Ile Glu Phe Glu  
100 105 110

Asp Ala Leu Glu Gln Glu Lys Lys Glu Leu Gln Ile Gln Val Glu His  
115 120 125

Tyr Glu Phe Gln Thr Arg Gln Leu Glu Leu Lys Ala Lys Asn Tyr Ala  
130 135 140

Asp Gln Ile Ser Arg Leu Glu Glu Arg Glu Ser Glu Met Lys Lys Glu  
145 150 155 160

Tyr Asn Ala Leu His Gln Arg His Thr Glu Met Ile Gln Thr Tyr Val  
165 170 175

Glu	His	Ile	Glu	Arg	Ser	Lys	Met	Gln	Gln	Val	Gly	Gly	Ser	Gly	Gln		
			180					185					190				
Thr	Glu	Ser	Ser	Leu	Pro	Gly	Arg	Ser	Pro	Arg	Gln	Ser	Trp	Arg	Lys		
		195					200					205					
Ser	Arg	Lys	Glu	Arg	Pro	Thr	Ser	Leu	Asn	Val	Phe	Pro	Leu	Ala	Asp		
	210					215					220						
Gly	Met	Cys	Pro	Asn	Asp	Glu	Met	Ser	Glu	Ser	Gly	Gln	Ser	Ser	Ala		
225					230					235					240		
Ala	Ala	Thr	Pro	Ser	Thr	Thr	Gly	Thr	Lys	Ser	Asn	Thr	Pro	Thr	Ser		
				245					250					255			
Ser	Val	Pro	Ser	Ala	Ala	Val	Thr	Pro	Leu	Asn	Glu	Ser	Leu	Gln	Pro		
			260					265					270				
Leu	Gly	Asp	Tyr	Val	Ser	Val	Thr	Lys	Asn	Asn	Lys	Gln	Ala	Arg	Glu		
		275					280					285					
Lys	Arg	Asn	Ser	Arg	Asn	Met	Glu	Val	Gln	Val	Thr	Gln	Glu	Met	Arg		
	290					295					300						
Asn	Val	Ser	Ile	Gly	Met	Gly	Ser	Ser	Asp	Glu	Trp	Ser	Asp	Val	Gln		
305					310					315					320		
Asp	Ile	Ile	Asp	Ser	Thr	Pro	Glu	Leu	Asp	Val	Cys	Pro	Glu	Thr	Arg		
				325					330					335			
Leu	Glu	Arg	Thr	Gly	Ser	Ser	Pro	Thr	Gln	Gly	Ile	Val	Asn	Lys	Ala		
			340					345					350				
Phe	Gly	Ile	Asn	Thr	Asp	Ser	Leu	Tyr	His	Glu	Leu	Ser	Thr	Ala	Gly		
	355						360					365					
Ser	Glu	Val	Ile	Gly	Asp	Val	Asp	Glu	Gly	Ala	Asp	Leu	Leu	Gly	Glu		
	370					375					380						
Phe	Ser	Val	Arg	Asp	Asp	Phe	Phe	Gly	Met	Gly	Lys	Glu	Val	Gly	Asn		
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Leu	Leu	Leu	Glu	Asn	Ser	Gln	Leu	Leu	Glu	Thr	Lys	Asn	Ala	Leu	Asn		
				405					410					415			
Val	Val	Lys	Asn	Asp	Leu	Ile	Ala	Lys	Val	Asp	Gln	Leu	Ser	Gly	Glu		
			420					425					430				
Gln	Glu	Val	Leu	Lys	Gly	Glu	Leu	Glu	Ala	Ala	Lys	Gln	Ala	Lys	Val		
		435					440					445					
Lys	Leu	Glu	Asn	Arg	Ile	Lys	Glu	Leu	Glu	Glu	Glu	Leu	Lys	Arg	Val		
	450					455					460						
Lys	Ser	Glu	Ala	Val	Thr	Ala	Arg	Arg	Glu	Pro	Arg	Glu	Glu	Val	Glu		
465					470					475					480		
Asp	Val	Ser	Ser	Tyr	Leu	Cys	Thr	Glu	Leu	Asp	Lys	Ile	Pro	Met	Ala		
				485					490					495			

Gln Arg Arg Arg Phe Thr Arg Val Glu Met Ala Arg Val Leu Met Glu  
 500 505 510  
 Arg Asn Gln Tyr Lys Glu Arg Leu Met Glu Leu Gln Glu Ala Val Arg  
 515 520 525  
 Trp Thr Glu Met Ile Arg Ala Ser Arg Glu His Pro Ser Val Gln Glu  
 530 535 540  
 Lys Lys Lys Ser Thr Ile Trp Gln Phe Phe Ser Arg Leu Phe Ser Ser  
 545 550 555 560  
 Ser Ser Ser Pro Pro Pro Ala Lys Arg Ser Tyr Pro Ser Val Asn Ile  
 565 570 575  
 His Tyr Lys Ser Pro Thr Ala Ala Gly Phe Ser Gln Arg Arg Ser His  
 580 585 590  
 Ala Leu Cys Gln Ile Ser Ala Gly Ser Arg Pro Leu Glu Phe Phe Pro  
 595 600 605  
 Asp Asp Asp Cys Thr Ser Ser Ala Arg Arg Glu Gln Lys Arg Glu Gln  
 610 615 620  
 Tyr Arg Gln Val Arg Glu His Val Arg Asn Asp Asp Gly Arg Leu Gln  
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 Ala Cys Gly Trp Ser Leu Pro Ala Lys Tyr Lys Gln Leu Ser Pro Asn  
 645 650 655  
 Gly Gly Gln Glu Asp Thr Arg Met Lys Asn Val Pro Val Pro Val Tyr  
 660 665 670  
 Cys Arg Pro Leu Val Glu Lys Asp Pro Ser Thr Lys Leu Trp Cys Ala  
 675 680 685  
 Ala Gly Val Asn Leu Ser Gly Trp Lys Pro His Glu Glu Asp Ser Ser  
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 Asn Gly Pro Lys Pro Val Pro Gly Arg Asp Pro Leu Thr Cys Asp Arg  
 705 710 715 720  
 Glu Gly Glu Gly Glu Pro Lys Ser Thr His Pro Ser Pro Glu Lys Lys  
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 Lys Ala Lys Glu Thr Pro Glu Ala Asp Ala Thr Ser Ser Arg Val Trp  
 740 745 750  
 Ile Leu Thr Ser Thr Leu Thr Thr Ser Lys Val Val Ile Ile Asp Ala  
 755 760 765  
 Asn Gln Pro Gly Thr Ile Val Asp Gln Phe Thr Val Cys Asn Ala His  
 770 775 780  
 Val Leu Cys Ile Ser Ser Ile Pro Ala Ala Ser Asp Ser Asp Tyr Pro  
 785 790 795 800  
 Pro Gly Glu Met Phe Leu Asp Ser Asp Val Asn Pro Glu Asp Ser Gly  
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Ala Asp Gly Val Leu Ala Gly Ile Thr Leu Val Gly Cys Ala Thr Arg  
 820 825 830  
 Cys Asn Val Pro Arg Ser Asn Cys Ser Ser Arg Gly Asp Thr Pro Val  
 835 840 845  
 Leu Asp Lys Gly Gln Gly Asp Val Ala Thr Thr Ala Asn Gly Lys Val  
 850 855 860  
 Asn Pro Ser Gln Ser Thr Glu Glu Ala Thr Glu Ala Thr Glu Val Pro  
 865 870 875 880  
 Asp Pro Gly Pro Ser Glu Ser Glu Ala Thr Thr Val Arg Pro Gly Pro  
 885 890 895  
 Leu Thr Glu His Val Phe Thr Asp Pro Ala Pro Thr Pro Ser Ser Ser  
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 Thr Gln Pro Ala Ser Glu Asn Gly Ser Glu Ser Asn Gly Thr Ile Val  
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 Gln Pro Gln Val Glu Pro Ser Gly Glu Leu Ser Thr Thr Thr Ser Ser  
 930 935 940  
 Ala Ala Pro Thr Met Trp Leu Gly Ala Gln Asn Gly Trp Leu Tyr Val  
 945 950 955 960  
 His Ser Ala Val Ala Asn Trp Lys Lys Cys Leu His Ser Ile Lys Leu  
 965 970 975  
 Lys Asp Ser Val Leu Ser Leu Val His Val Lys Gly Arg Val Leu Val  
 980 985 990  
 Ala Leu Ala Asp Gly Thr Leu Ala Ile Phe His Arg Gly Glu Asp Gly  
 995 1000 1005  
 Gln Trp Asp Leu Ser Asn Tyr His Leu Met Asp Leu Gly His Pro His  
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 His Ser Ile Arg Cys Met Ala Val Val Asn Asp Arg Val Trp Cys Gly  
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 Tyr Lys Asn Lys Val His Val Ile Gln Pro Lys Thr Met Gln Ile Glu  
 1045 1050 1055  
 Lys Ser Phe Asp Ala His Pro Arg Arg Glu Ser Gln Val Arg Gln Leu  
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 Ala Trp Ile Gly Asp Gly Val Trp Val Ser Ile Arg Leu Asp Ser Thr  
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 Leu Arg Leu Tyr His Ala His Thr His Gln His Leu Gln Asp Val Asp  
 1090 1095 1100  
 Ile Glu Pro Tyr Val Ser Lys Met Leu Gly Thr Gly Lys Leu Gly Phe  
 1105 1110 1115 1120  
 Ser Phe Val Arg Ile Thr Ala Leu Leu Ile Ala Gly Asn Arg Leu Trp  
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Val Gly Thr Gly Asn Gly Val Val Ile Ser Ile Pro Leu Thr Glu Thr  
 1140 1145 1150  
 Val Val Leu His Arg Gly Gln Leu Leu Gly Leu Arg Ala Asn Lys Thr  
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 Ser Pro Thr Ser Gly Glu Gly Thr Arg Pro Gly Gly Ile Ile His Val  
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 Tyr Gly Asp Asp Ser Ser Asp Lys Ala Ala Ser Ser Phe Ile Pro Tyr  
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 Cys Ser Met Ala Gln Ala Gln Leu Cys Phe His Gly His Arg Asp Ala  
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 Val Lys Phe Phe Val Ser Val Pro Gly Asn Val Leu Ala Thr Leu Asn  
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 Gly Ser Val Leu Asp Ser Pro Ser Glu Gly Pro Gly Pro Ala Ala Pro  
 1235 1240 1245  
 Ala Ala Asp Ala Glu Gly Gln Lys Leu Lys Asn Ala Leu Val Leu Ser  
 1250 1255 1260  
 Gly Gly Glu Gly Tyr Ile Asp Phe Arg Ile Gly Asp Gly Glu Asp Asp  
 1265 1270 1275 1280  
 Glu Thr Glu Glu Cys Ala Gly Asp Val Asn Gln Thr Lys Pro Ser Leu  
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 Pro Glu

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 Ala Gly Ser Ile Tyr Arg Glu Phe Glu Arg Leu Ile His Cys Tyr Asp  
 35 40 45  
 Glu Glu Val Val Lys Glu Leu Met Pro Leu Val Val Asn Val Leu Glu  
 50 55 60  
 Asn Leu Asp Ser Val Leu Ser Glu Asn Gln Glu His Glu Val Glu Leu  
 65 70 75 80  
 Glu Leu Leu Arg Glu Asp Asn Glu Gln Leu Leu Thr Gln Tyr Glu Arg

85

90

95

Glu Lys Ala	Leu Arg Lys	Gln Ala	Glu Glu Lys	Phe Ile	Glu Phe Glu	
	100		105		110	
Asp Ala Leu	Glu Gln Glu	Lys Lys	Glu Leu Gln	Ile Gln	Val Glu His	
	115		120		125	
Tyr Glu Phe	Gln Thr Arg	Gln Leu	Glu Leu Lys	Ala Lys	Asn Tyr Ala	
	130		135		140	
Asp Gln Ile	Ser Arg Leu	Glu Glu	Arg Glu Ser	Glu Met	Lys Lys Glu	
	145		150		155	160
Tyr Asn Ala	Leu His Gln	Arg His	Thr Glu Met	Ile Gln	Thr Tyr Val	
	165		170		175	
Glu His Ile	Glu Arg Ser	Lys Met	Gln Gln Val	Gly Gly	Ser Gly Gln	
	180		185		190	
Thr Glu Ser	Ser Leu Pro	Gly Arg	Ser Arg Lys	Glu Arg	Pro Thr Ser	
	195		200		205	
Leu Asn Val	Phe Pro Leu	Ala Asp	Gly Met Val	Arg Ala	Gln Met Gly	
	210		215		220	
Gly Lys Leu	Val Pro Ala	Gly Asp	His Trp His	Leu Ser	Asp Leu Gly	
	225		230		235	240
Gln Leu Gln	Ser Ser Ser	Tyr Gln	Cys Pro	Asn Asp	Glu Met Ser	
	245		250		255	
Glu Ser Gly	Gln Ser Ser	Ala Ala	Ala Thr	Pro Ser	Thr Thr Gly	Thr
	260		265		270	
Lys Ser Asn	Thr Pro Thr	Ser Ser	Val Pro	Ser Ala	Ala Val Thr	Pro
	275		280		285	
Leu Asn Glu	Ser Leu Gln	Pro Leu	Gly Asp Tyr	Val Ser	Val Thr Lys	
	290		295		300	
Asn Asn Lys	Gln Ala Arg	Glu Lys	Arg Asn	Ser Arg	Asn Met Glu	Val
	305		310		315	320
Gln Val Thr	Gln Glu Met	Arg Asn	Val Ser	Ile Gly	Met Gly Ser	Ser
	325		330		335	
Asp Glu Trp	Ser Asp Val	Gln Asp	Ile Ile	Asp Ser	Thr Pro Glu	Leu
	340		345		350	
Asp Val Cys	Pro Glu Thr	Arg Leu	Glu Arg	Thr Gly	Ser Ser Pro	Thr
	355		360		365	
Gln Gly Ile	Val Asn Lys	Ala Phe	Gly Ile	Asn Thr	Asp Ser Leu	Tyr
	370		375		380	
His Glu Leu	Ser Thr Ala	Gly Ser	Glu Val	Ile Gly	Asp Val Asp	Glu
	385		390		395	400
Gly Ala Asp	Leu Leu Gly	Glu Phe	Ser Val	Arg Asp	Asp Phe Phe	Gly

405										410					415				
Met	Gly	Lys	Glu	Val	Gly	Asn	Leu	Leu	Leu	Glu	Asn	Ser	Gln	Leu	Leu				
			420					425					430						
Glu	Thr	Lys	Asn	Ala	Leu	Asn	Val	Val	Lys	Asn	Asp	Leu	Ile	Ala	Lys				
		435					440					445							
Val	Asp	Gln	Leu	Ser	Gly	Glu	Gln	Glu	Val	Leu	Lys	Gly	Glu	Leu	Glu				
	450					455					460								
Ala	Ala	Lys	Gln	Ala	Lys	Val	Lys	Leu	Glu	Asn	Arg	Ile	Lys	Glu	Leu				
465					470					475					480				
Glu	Glu	Glu	Leu	Lys	Arg	Val	Lys	Ser	Glu	Ala	Val	Thr	Ala	Arg	Arg				
				485					490					495					
Glu	Pro	Arg	Glu	Glu	Val	Glu	Asp	Val	Ser	Ser	Tyr	Leu	Cys	Thr	Glu				
			500					505					510						
Leu	Asp	Lys	Ile	Pro	Met	Ala	Gln	Arg	Arg	Arg	Phe	Thr	Arg	Val	Glu				
		515					520					525							
Met	Ala	Arg	Val	Leu	Met	Glu	Arg	Asn	Gln	Tyr	Lys	Glu	Arg	Leu	Met				
	530					535					540								
Glu	Leu	Gln	Glu	Ala	Val	Arg	Trp	Thr	Glu	Met	Ile	Arg	Ala	Ser	Arg				
545					550					555					560				
Glu	His	Pro	Ser	Val	Gln	Glu	Lys	Lys	Lys	Ser	Thr	Ile	Trp	Gln	Phe				
				565					570					575					
Phe	Ser	Arg	Leu	Phe	Ser	Ser	Ser	Ser	Ser	Pro	Pro	Pro	Ala	Lys	Arg				
			580					585					590						
Ser	Tyr	Pro	Ser	Val	Asn	Ile	His	Tyr	Lys	Ser	Pro	Thr	Ala	Ala	Gly				
		595				600						605							
Phe	Ser	Gln	Arg	Arg	Ser	His	Ala	Leu	Cys	Gln	Ile	Ser	Ala	Gly	Ser				
	610					615					620								
Arg	Pro	Leu	Glu	Phe	Phe	Pro	Asp	Asp	Asp	Cys	Thr	Ser	Ser	Ala	Arg				
625					630					635					640				
Arg	Glu	Gln	Lys	Arg	Glu	Gln	Tyr	Arg	Gln	Val	Arg	Glu	His	Val	Arg				
				645					650					655					
Asn	Asp	Asp	Gly	Arg	Leu	Gln	Ala	Cys	Gly	Trp	Ser	Leu	Pro	Ala	Lys				
			660					665					670						
Tyr	Lys	Gln	Leu	Ser	Pro	Asn	Gly	Gly	Gln	Glu	Asp	Thr	Arg	Met	Lys				
		675					680					685							
Asn	Val	Pro	Val	Pro	Val	Tyr	Cys	Arg	Pro	Leu	Val	Glu	Lys	Asp	Pro				
	690					695					700								
Ser	Thr	Lys	Leu	Trp	Cys	Ala	Ala	Gly	Val	Asn	Leu	Ser	Gly	Trp	Lys				
705					710					715					720				
Pro	His	Glu	Glu	Asp	Ser	Ser	Asn	Gly	Pro	Lys	Pro	Val	Pro	Gly	Arg				

725										730					735				
Asp	Pro	Leu	Thr	Cys	Asp	Arg	Glu	Gly	Glu	Gly	Glu	Pro	Lys	Ser	Thr				
			740					745					750						
His	Pro	Ser	Pro	Glu	Lys	Lys	Lys	Ala	Lys	Glu	Thr	Pro	Glu	Ala	Asp				
		755					760					765							
Ala	Thr	Ser	Ser	Arg	Val	Trp	Ile	Leu	Thr	Ser	Thr	Leu	Thr	Thr	Ser				
	770					775					780								
Lys	Val	Val	Ile	Ile	Asp	Ala	Asn	Gln	Pro	Gly	Thr	Ile	Val	Asp	Gln				
785					790					795					800				
Phe	Thr	Val	Cys	Asn	Ala	His	Val	Leu	Cys	Ile	Ser	Ser	Ile	Pro	Ala				
				805					810					815					
Ala	Ser	Asp	Ser	Asp	Tyr	Pro	Pro	Gly	Glu	Met	Phe	Leu	Asp	Ser	Asp				
			820					825					830						
Val	Asn	Pro	Glu	Asp	Ser	Gly	Ala	Asp	Gly	Val	Leu	Ala	Gly	Ile	Thr				
		835					840					845							
Leu	Val	Gly	Cys	Ala	Thr	Arg	Cys	Asn	Val	Pro	Arg	Ser	Asn	Cys	Ser				
	850					855					860								
Ser	Arg	Gly	Asp	Thr	Pro	Val	Leu	Asp	Lys	Gly	Gln	Gly	Asp	Val	Ala				
865					870					875					880				
Thr	Thr	Ala	Asn	Gly	Lys	Val	Asn	Pro	Ser	Gln	Ser	Thr	Glu	Glu	Ala				
				885					890						895				
Thr	Glu	Ala	Thr	Glu	Val	Pro	Asp	Pro	Gly	Pro	Ser	Glu	Ser	Glu	Ala				
			900					905						910					
Thr	Thr	Val	Arg	Pro	Gly	Pro	Leu	Thr	Glu	His	Val	Phe	Thr	Asp	Pro				
		915					920					925							
Ala	Pro	Thr	Pro	Ser	Ser	Ser	Thr	Gln	Pro	Ala	Ser	Glu	Asn	Gly	Ser				
	930					935					940								
Glu	Ser	Asn	Gly	Thr	Ile	Val	Gln	Pro	Gln	Val	Glu	Pro	Ser	Gly	Glu				
945					950					955					960				
Leu	Ser	Thr	Thr	Thr	Ser	Ser	Ala	Ala	Pro	Thr	Met	Trp	Leu	Gly	Ala				
				965					970					975					
Gln	Asn	Gly	Trp	Leu	Tyr	Val	His	Ser	Ala	Val	Ala	Asn	Trp	Lys	Lys				
			980					985					990						
Cys	Leu	His	Ser	Ile	Lys	Leu	Lys	Asp	Ser	Val	Leu	Ser	Leu	Val	His				
	995					1000						1005							
Val	Lys	Gly	Arg	Val	Leu	Val	Ala	Leu	Ala	Asp	Gly	Thr	Leu	Ala	Ile				
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Phe	His	Arg	Gly	Glu	Asp	Gly	Gln	Trp	Asp	Leu	Ser	Asn	Tyr	His	Leu				
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<213> Mouse

<400> 12

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			20					25					30		
Ala	Gly	Ser	Ile	Tyr	Arg	Glu	Phe	Glu	Arg	Leu	Ile	His	Cys	Tyr	Asp
		35					40					45			
Glu	Glu	Val	Val	Lys	Glu	Leu	Met	Pro	Leu	Val	Val	Asn	Val	Leu	Glu
	50					55					60				
Asn	Leu	Asp	Ser	Val	Leu	Ser	Glu	Asn	Gln	Glu	His	Glu	Val	Glu	Leu
65					70					75					80
Glu	Leu	Leu	Arg	Glu	Asp	Asn	Glu	Gln	Leu	Leu	Thr	Gln	Tyr	Glu	Arg
				85					90					95	
Glu	Lys	Ala	Leu	Arg	Lys	Gln	Ala	Glu	Glu	Lys	Phe	Ile	Glu	Phe	Glu
			100					105					110		
Asp	Ala	Leu	Glu	Gln	Glu	Lys	Lys	Glu	Leu	Gln	Ile	Gln	Val	Glu	His
		115					120					125			
Tyr	Glu	Phe	Gln	Thr	Arg	Gln	Leu	Glu	Leu	Lys	Ala	Lys	Asn	Tyr	Ala
	130					135					140				
Asp	Gln	Ile	Ser	Arg	Leu	Glu	Glu	Arg	Glu	Ser	Glu	Met	Lys	Lys	Glu
145					150					155					160
Tyr	Asn	Ala	Leu	His	Gln	Arg	His	Thr	Glu	Met	Ile	Gln	Thr	Tyr	Val
				165					170					175	
Glu	His	Ile	Glu	Arg	Ser	Lys	Met	Gln	Gln	Val	Gly	Gly	Ser	Gly	Gln
			180					185					190		
Thr	Glu	Ser	Ser	Leu	Pro	Gly	Arg	Arg	Lys	Glu	Arg	Pro	Thr	Ser	Leu
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Asn	Val	Phe	Pro	Leu	Ala	Asp	Gly	Met	Val	Arg	Ala	Gln	Met	Gly	Gly
	210					215					220				
Lys	Leu	Val	Pro	Ala	Gly	Asp	His	Trp	His	Leu	Ser	Asp	Leu	Gly	Gln
225					230					235					240
Leu	Gln	Ser	Ser	Ser	Ser	Tyr	Gln	Cys	Pro	Asn	Asp	Glu	Met	Ser	Glu
				245					250					255	
Ser	Gly	Gln	Ser	Ser	Ala	Ala	Ala	Thr	Pro	Ser	Thr	Thr	Gly	Thr	Lys
			260					265					270		
Ser	Asn	Thr	Pro	Thr	Ser	Ser	Val	Pro	Ser	Ala	Ala	Val	Thr	Pro	Leu
		275					280					285			
Asn	Glu	Ser	Leu	Gln	Pro	Leu	Gly	Asp	Tyr	Val	Ser	Val	Thr	Lys	Asn
	290					295					300				

Asn	Lys	Gln	Ala	Arg	Glu	Lys	Arg	Asn	Ser	Arg	Asn	Met	Glu	Val	Gln	305	310	315	320
Val	Thr	Gln	Glu	Met	Arg	Asn	Val	Ser	Ile	Gly	Met	Gly	Ser	Ser	Asp	325	330	335	
Glu	Trp	Ser	Asp	Val	Gln	Asp	Ile	Ile	Asp	Ser	Thr	Pro	Glu	Leu	Asp	340	345	350	
Val	Cys	Pro	Glu	Thr	Arg	Leu	Glu	Arg	Thr	Gly	Ser	Ser	Pro	Thr	Gln	355	360	365	
Gly	Ile	Val	Asn	Lys	Ala	Phe	Gly	Ile	Asn	Thr	Asp	Ser	Leu	Tyr	His	370	375	380	
Glu	Leu	Ser	Thr	Ala	Gly	Ser	Glu	Val	Ile	Gly	Asp	Val	Asp	Glu	Gly	385	390	395	400
Ala	Asp	Leu	Leu	Gly	Glu	Phe	Ser	Val	Arg	Asp	Asp	Phe	Phe	Gly	Met	405	410	415	
Gly	Lys	Glu	Val	Gly	Asn	Leu	Leu	Leu	Glu	Asn	Ser	Gln	Leu	Leu	Glu	420	425	430	
Thr	Lys	Asn	Ala	Leu	Asn	Val	Val	Lys	Asn	Asp	Leu	Ile	Ala	Lys	Val	435	440	445	
Asp	Gln	Leu	Ser	Gly	Glu	Gln	Glu	Val	Leu	Lys	Gly	Glu	Leu	Glu	Ala	450	455	460	
Ala	Lys	Gln	Ala	Lys	Val	Lys	Leu	Glu	Asn	Arg	Ile	Lys	Glu	Leu	Glu	465	470	475	480
Glu	Glu	Leu	Lys	Arg	Val	Lys	Ser	Glu	Ala	Val	Thr	Ala	Arg	Arg	Glu	485	490	495	
Pro	Arg	Glu	Glu	Val	Glu	Asp	Val	Ser	Ser	Tyr	Leu	Cys	Thr	Glu	Leu	500	505	510	
Asp	Lys	Ile	Pro	Met	Ala	Gln	Arg	Arg	Arg	Phe	Thr	Arg	Val	Glu	Met	515	520	525	
Ala	Arg	Val	Leu	Met	Glu	Arg	Asn	Gln	Tyr	Lys	Glu	Arg	Leu	Met	Glu	530	535	540	
Leu	Gln	Glu	Ala	Val	Arg	Trp	Thr	Glu	Met	Ile	Arg	Ala	Ser	Arg	Glu	545	550	555	560
His	Pro	Ser	Val	Gln	Glu	Lys	Lys	Lys	Ser	Thr	Ile	Trp	Gln	Phe	Phe	565	570	575	
Ser	Arg	Leu	Phe	Ser	Ser	Ser	Ser	Ser	Pro	Pro	Pro	Ala	Lys	Arg	Ser	580	585	590	
Tyr	Pro	Ser	Val	Asn	Ile	His	Tyr	Lys	Ser	Pro	Thr	Ala	Ala	Gly	Phe	595	600	605	
Ser	Gln	Arg	Arg	Ser	His	Ala	Leu	Cys	Gln	Ile	Ser	Ala	Gly	Ser	Arg	610	615	620	

Pro Leu Glu Phe Phe Pro Asp Asp Asp Cys Thr Ser Ser Ala Arg Arg  
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 Glu Gln Lys Arg Glu Gln Tyr Arg Gln Val Arg Glu His Val Arg Asn  
 645 650 655  
 Asp Asp Gly Arg Leu Gln Ala Cys Gly Trp Ser Leu Pro Ala Lys Tyr  
 660 665 670  
 Lys Gln Leu Ser Pro Asn Gly Gly Gln Glu Asp Thr Arg Met Lys Asn  
 675 680 685  
 Val Pro Val Pro Val Tyr Cys Arg Pro Leu Val Glu Lys Asp Pro Ser  
 690 695 700  
 Thr Lys Leu Trp Cys Ala Ala Gly Val Asn Leu Ser Gly Trp Lys Pro  
 705 710 715 720  
 His Glu Glu Asp Ser Ser Asn Gly Pro Lys Pro Val Pro Gly Arg Asp  
 725 730 735  
 Pro Leu Thr Cys Asp Arg Glu Gly Glu Gly Glu Pro Lys Ser Thr His  
 740 745 750  
 Pro Ser Pro Glu Lys Lys Lys Ala Lys Glu Thr Pro Glu Ala Asp Ala  
 755 760 765  
 Thr Ser Ser Arg Val Trp Ile Leu Thr Ser Thr Leu Thr Thr Ser Lys  
 770 775 780  
 Val Val Ile Ile Asp Ala Asn Gln Pro Gly Thr Ile Val Asp Gln Phe  
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 Thr Val Cys Asn Ala His Val Leu Cys Ile Ser Ser Ile Pro Ala Ala  
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 Thr Ala Asn Gly Lys Val Asn Pro Ser Gln Ser Thr Glu Glu Ala Thr  
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 Asn Gly Trp Leu Tyr Val His Ser Ala Val Ala Asn Trp Lys Lys Cys  
 980 985 990  
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 995 1000 1005  
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Gln Glu Ile His Glu Lys Val Leu Asn Glu Ala Val Gly Ala Leu Met  
50 55 60

Tyr His Thr Ile Thr Leu Thr Arg Glu Asp Leu Glu Lys Phe Lys Ala  
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Leu Arg Ile Ile Val Arg Ile Gly Ser Gly Phe Asp Asn Ile Asp Ile  
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Lys Ser Ala Gly Asp Leu Gly Ile Ala Val Cys Asn Val Pro Ala Ala  
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Ser Val Glu Glu Thr Ala Asp Ser Thr Leu Cys His Ile Leu Asn Leu  
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Ile Arg Gly Glu Thr Leu Gly Ile Ile Gly Leu Gly Arg Val Gly Gln  
165 170 175

Ala Val Ala Leu Arg Ala Lys Ala Phe Gly Phe Asn Val Leu Phe Tyr  
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Asp Pro Tyr Leu Ser Asp Gly Ile Glu Arg Ala Leu Gly Leu Gln Arg  
195 200 205

Val Ser Thr Leu Gln Asp Leu Leu Phe His Ser Asp Cys Val Thr Leu  
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 His Cys Gly Leu Asn Glu His Asn His His Leu Ile Asn Asp Phe Thr  
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 Val Lys Gln Met Arg Gln Gly Ala Phe Leu Val Asn Thr Ala Arg Gly  
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 Gly Leu Val Asp Glu Lys Ala Val Ala Gln Ala Leu Lys Glu Gly Arg  
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 Lys Asn Cys Val Asn Lys Asp His Leu Thr Ala Ala Thr His Trp Ala  
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 Thr Val Ser Gly Gly Arg Gly Leu Ala Cys Glu Pro Arg Ser Gly Leu

50

55

60

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Leu	Ala	Phe	Ser	Pro	Asp	Gly	Lys	Tyr	Leu	Val	Thr	Gly	Glu	Ser	Gly
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Ala	Glu	Leu	Gln	Glu	His	Lys	Tyr	Gly	Val	Ala	Cys	Val	Ala	Phe	Ser
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Val	Asn	Val	Trp	Ala	Trp	Lys	Lys	Asn	Ile	Val	Val	Ala	Ser	Asn	Lys
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Val	Ser	Ser	Arg	Val	Thr	Ala	Val	Ser	Phe	Ser	Glu	Asp	Cys	Ser	Tyr
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Phe	Ser	Gly	Gly	Val	Asn	Ala	Arg	Tyr	Pro	Asp	Thr	Ile	Ala	Leu	Thr
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Ile	Tyr	Val	Trp	Asp	Val	Arg	Asp	Pro	Lys	Lys	Val	Gly	Lys	Val	Tyr



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Ser	Ala	Leu	Tyr	His	Ser	Ser	Cys	Val	Trp	Ser	Val	Glu	Val	Tyr	Pro
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Glu	Ile	Lys	Asp	Ser	His	Gln	Ala	Cys	Leu	Pro	Leu	Ser	Ser	Phe	Ile
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Thr	Cys	Ser	Ser	Asp	Asn	Thr	Ile	Arg	Leu	Trp	Asn	Thr	Glu	Ser	Ser
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Gly	Val	His	Gly	Ser	Thr	Leu	His	Arg	Asn	Ile	Leu	Ser	Asn	Asp	Leu
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Met	Thr	Ile	Ser 740	Met	Arg	Gln	Arg	Leu 745	Arg	Glu	Arg	Arg	Gln 750	Arg	Gln
Arg	Gly	Ile 755	Lys	Gln	Gln	Gly	Pro 760	Thr	Ser	Pro	Gln	Arg 765	Ala	Ser	Gly
Ala	Lys 770	Gln	His	His	Ala	Pro 775	Val	Val	Pro	Pro	Ser 780	Gly	Pro	Ala	Leu
Ser 785	Ser	Asp	Ser	Asp	Lys 790	Glu	Gly	Glu	Asp	Glu 795	Gly	Thr	Glu	Glu	Glu 800
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Ala	Ser	Gly	Ser 820	Ser	Pro	Ala	Leu	Leu 825	Arg	Ser	Leu	Ser	His 830	Trp	Glu
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Pro	Thr	Gly	Gly 980	Ser	Leu	Gly	Arg	Met 985	Tyr	Pro	Gly	Ser	Arg 990	Gly	Ser
Glu	Lys	His 995	Ser	Pro	Asp	Ser	Ala 1000	Cys	Ser	Val	Asp	Tyr 1005	Ser	Ser	Ser
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Gln Val Gln Thr Leu Pro Leu Arg Glu Pro Ser Leu Ser Ser Ser Gly 1105                      1110                      1115                      1120		
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Glu Pro Ser Ser Gly Asn Ser Gly Pro Lys Gln Val Ala Pro Val Leu 1155                      1160                      1165		
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Gly Gly Cys Ser Ser Gln Pro His Ser Tyr Gln Asn His Thr Thr Ser 1235                      1240                      1245		
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Leu Ala Thr Glu Pro Gln Ala Pro Ala Pro Ile Arg Ile Ser Pro Phe 1265                      1270                      1275                      1280		
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Lys Pro Leu Pro Asp Arg Pro Thr Leu Thr Thr Phe Ser Pro Val Ser 1300                      1305                      1310		
Lys Gly Leu Thr His Asn Glu Thr Glu Gln Ser Gly Pro Leu Arg Glu 1315                      1320                      1325		
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 Arg Gly Pro Arg Asn Lys Lys Arg Gly Trp Arg Arg Leu Ala Glu Glu  
                     35                    40                    45  
 Pro Leu Gly Leu Glu Val Asp Gln Phe Leu Glu Asp Val Arg Leu Gln  
                     50                    55                    60  
 Glu Arg Thr Thr Gly Gly Leu Leu Ala Glu Ala Pro Asn Glu Lys Leu  
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 Thr Pro Lys Ala Lys Pro Gly Pro Gln Asp Ile Ile Glu Arg Pro Phe  
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 Tyr Asp Leu Trp Asn Pro Asp Asn Pro Leu Asp Thr Pro Leu Ile Gly  
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 Gln Asp Ala Phe Phe Leu Glu Gln Thr Lys Lys Lys Gly Val Arg Arg  
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 225 230 235 240  
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 260 265 270  
 Glu Lys Leu Glu Arg Gln Leu Ala Leu Pro Thr Ser Glu Gln Ala Ala  
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 Ala Gly Asp Gly Thr Thr Glu Ile Ser Pro Thr Gly Ala Ala Gly Pro  
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 Leu Gln His Gln Glu Leu Phe Arg Leu Arg Gly Ile Lys Ala Gln Val  
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 Arg Arg Leu Ala Glu Ala Asp Lys Pro Arg Arg Leu Gly Arg Leu Lys  
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 Tyr Gln Ala Pro Asp Ile Asp Val Gln Leu Ser Ser Glu Leu Ser Gly  
 420 425 430  
 Ser Leu Arg Thr Leu Lys Pro Glu Gly His Ile Leu Arg Asp Arg Phe  
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Lys Ser Phe Gln Lys Arg Asn Met Ile Glu Pro Arg Glu Arg Ala Lys  
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